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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/600,206	11/13/2000	Graham O'Neill	22749/04002	7913

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EXAMINER

MICHALSKI, JUSTIN I

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/600,206

Applicant(s)

O'NEILL ET AL.

Examiner

Justin Michalski

Art Unit

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 11, 12, 30-32 and 34-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11, 12, 40 and 41 is/are allowed.
- 6) ☒ Claim(s) 30-32 and 34-39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Amendment*

1. The Amendment filed 5 July 2005 has been entered.

### ***Claim Rejections - 35 USC § 103***

2. Claims 30, 31, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Michelson (US Patent 4,400,590) in view of Ngarmnil et al. (Hereinafter "Ngarmnil") (Ngarmnil, J. et al., "A fully tuneable micropower log-domain filter", IEE Colloquium on Low Power Analogue and Digital VLSI: ASICS, Techniques and Applications, London, 2 Jun 1995 Page(s) 9/1 - 9/4).

Regarding Claim 30, Michelson discloses a multi-channel analogue audio signal processor (Fig. 1) for use with a cochlear prosthesis, comprising: an input (transducer 10) for receiving an audio signal; a plurality of outputs for connecting to respective ones of cochlear implant electrodes (18); a plurality of analogue signal processing channels coupled to the input (Channels from 12 to 18), each channel comprising a tone control circuit (filter 14), and a tone generator (electrode array 18) for generating tones of preset amplitude (driver 16) and frequency dependent on the fundamental frequencies of the filters of the channels (filters 14).

Michelson does not disclose the tone control circuit comprising first and second log-domain filters having different low-pass bands and a subtractor for subtracting the output currents of the filters to produce a filtered signal, each of the filters comprising MOS transistors operating in weak inversion, and each filter being tunable in the audio frequency range to adjust the low-pass cut-off frequency. It is known in the art that the

subtraction of two parallel low-pass filters will produce a band-pass output. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the subtraction of two low-pass filters as an alternative to the band-pass filters (14) of Michelson.

Ngarmnil discloses a log domain MOS transistor filter operating in weak inversion and the cut-off frequency of the filter can be tuned via a current source (Page 9/1, I and II). Ngarmnil further discloses that the log-domain filter is very attractive to low power filters and very suitable for the applications in biomedical signal processing such as filters for electronic cochlea (Page 9/3, Conclusion). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cochlear implant of Michelson with the low-pass filter as disclosed by Ngarmnil since Ngarmnil discloses it is very suitable for biomedical applications such as electronic cochlea and in order to produce a circuit requiring less power consumption.

Regarding Claim 31, Michelson further discloses each channel comprising an amplifier (driver 16) having controllable gain (Column 5, lines 12-16).

Regarding Claim 36, Michelson further discloses separate filters (14) and drivers (16) that can independently adjusted by channel.

3. Claims 32-35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Michelson as modified as applied to claim 30 above, and further in view of Müller et al. (US Patent 5,814,095).

Regarding Claims 32 and 35, Michelson as modified discloses a processor as stated apropos of claim 32 but does not disclose use adjustments transmitted by a wireless remote control. Müller et al. discloses an implantable device whose audiological functions can be transcutaneously controlled by remote control to adapt to ambient acoustic conditions (Column 11, lines 25-41). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a remote control to change operating parameters for adapting to ambient acoustical conditions resulting in a higher quality audio signal.

Regarding Claim 34, Michelson further discloses tone generator control means for selecting the frequency of the tone produced by the tone generator (frequency components can be shaped to the requirements of the user (i.e. frequency can be selected)) (Column 2, lines 40-43).

4. Claims 37 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Michelson as modified as applied to claim 30 above, and further in view of Zierhofer (US Patent 5,983,139).

Regarding Claim 37, Michelson as modified discloses a processor as stated in claim 30 but does not disclose sampling means coupling the channels to the outputs. Zierhofer discloses continuous interleaved sampling successfully achieved high levels of speech recognition (Column 1, lines 13-16). Therefore, it would have been obvious to one of ordinary skill at the time the invention was made to implement sampling to create a high level of speech recognition with a cochlear implant.

Regarding Claim 38, Zierhofer further discloses the sampling means comprises a continuous interleaved sample generator (Column 1, lines 13-16).

5. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Michelson as modified as applied to claim 30 above, and further in view of Shannon (US Patent 5,549,658). Michelson as modified discloses a processor as stated in claim 30 but does not disclose the use of biphasic generators. Shannon discloses sampling means for applying samples of the frequency-separated signals to the respective biphasic signal generators (Column 14, lines 7-24). Shannon et al. teaches biphasic signals permit signals to be inductively coupled through the skin with reasonable efficiency (Column 15, lines 27-35). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a biphasic signal to efficiently couple an electric signal through the skin.

#### ***Allowable Subject Matter***

6. Claims 11, 12, 40, and 41 allowed.

#### ***Conclusion***


7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Michalski whose telephone number is (571)272-7524. The examiner can normally be reached on M-F 7-3:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571)272-7848. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JIM

  
July 25, 2005

  
VIVIAN CHIN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600